Do You Need to Report Your Water Use?

Michigan has laws aimed at protecting water without impeding dairy producers’ rights to use water. One component of this effort requires anyone with the ability to pump 70 gallons or more per minute to report their use. Large capacity pumps registered prior to February 1 will be assumed to not cause an adverse resource impact. This article summarizes what dairy producers should know about reporting water use and offers some tools for doing so effectively.

Christina Curell
Extension Water Quality Educator
Central Region

Water—some people have it and some do not. We are fortunate that the Great Lakes region has an abundance of this life giving resource. With that abundance, however, issues arose that caused concern and dissention in the populace. Industries and special interest groups debated the best use of our water resources and ways to protect it. State and provincial governments got involved and entered into compacts that will ensure that everyone who uses the water will get a voice in decisions about water use. Laws were enacted that will protect the water but not relinquish industries’ or citizens’ rights to use the water. This is a brief look at water reporting legislation.

Annual Water Use Reporting
Public Act 148 of 2004 requires that all water users who have the capacity to pump 70 gallons or more per minute (100,000 gal/day) from one site or a combination of sites from ground or surface water must report their annual usage per pump. Agricultural water users report to the Michigan Department of Agriculture (MDA) while all other users must report to the Michigan Department of Environmental Quality (MDEQ). Dairy farms that have a well that services residences as well
Do You Need to Report Your Water Use? ........................................... 1
Industry Professionals View- 2008 Industry Survey ................. 3
Wintering Lots: Capture Fertilizer Value of Manure ............. 7
Bovine Leukosis Virus ................................................................. 7
Environmental Stewardship and MAEAP .............................. 10
Test and Remove for bTB Eradication ................................. 13
Right to Farm and On-farm Compost Production ............... 16
Manure Sense ........................................................................... 17
Animal Science Internships .................................................... 18
Milk Market & Policy Update .................................................. 20
Carbon Market Opportunities for Agriculture ................... 22
Calendar of Events .................................................................. 23

Contents

MICHIGAN STATE
UNIVERSITY

MSU Extension Dairy Educators

Ben Bartlett ................................................................. 906-439-5880
(bartle18@msu.edu)
The Upper Peninsula
Faith Cullens .............................................................. 989-224-5249
(cullensf@msu.edu)
Clinton, Gratiot, Shiawassee
Phil Durst ................................................................. 989-826-1160
(durstp@msu.edu)
NE-MI -(North & East of US-127 & I-75)
Ira Krupp ................................................................. 517-279-4311
(kruppi@msu.edu)
Allagae, Berrien, Branch, Cass, Hillsdale, Kalamazoo, St. Joseph,
Van Buren
Kathy Lee ................................................................. 231-839-4667
(leeka@msu.edu)
NW-MI -(Osceola, Lake, Mason, Mecosta, North & West of US-127
& I-75)
Mike McFadden ......................................................... 989-772-0911 E-302
(mcfadd10@msu.edu)
Isabella, Clare, Gladwin, Midland, Saginaw
Bill Robb ................................................................. 616-994-4580
(robgb@msu.edu)
Kent, Muskegon, Montcalm, Newaygo, Oceana, Ottawa
Dean Ross ............................................................... 517-546-3950
(rossdea@msu.edu)
Genesee, Ingham, Jackson, Monroe, Macomb, Livingston, Oakland,
Lenawee, Washtenaw, Wayne
Phil Taylor ................................................................. 517-543-2310
(taylo262@msu.edu)
Barry, Calhoun, Eaton, Ionia
Craig Thomas ......................................................... 810-648-2515
(thomasc@msu.edu)
Sanilac, Huron, Lapeer, St. Clair, Tuscola

as farm facilities can subtract domestic use from their pump capacity to determine if they need to report.

The information that is on the water use report has changed little since the law was enacted. Pump ID, county, township, whether it is a surface or groundwater withdrawal, pump’s rate of capacity, and latitude and longitude coordinates of the pump within 25 feet must be reported. It is extremely important that latitude and longitude be recorded for each pump. Public Act 185 of 2008 requires that all new large capacity withdrawals use a Water Withdrawal Assessment Tool. In order for the tool to have accurate data it must have the exact location of the well within the watershed. The model uses latitude and longitude coordinates to determine existing uses.

The water usage for each pump must be reported by month. Water use for irrigation can be reported as acre-inches or gallons. A fact sheet and Excel spreadsheet have been developed that will help dairy producers determine how much water they use for watering cattle; clean-up of the milking equipment, bulk tank and parlor; milk-precooling and miscellaneous tasks. You can access these tools at <http://www.mdr.msu.edu> or by contacting your Extension Dairy Educator.

The annual water use reporting form also includes a page for indicating which conservation practices are used on the farm. Producers need to check the box(es) for those practices that they use.

MDA compiles the annual water use information by townships and by latitude and longitude coordinates, not by farm, and sends it to MDEQ. MDEQ then compiles all water uses by township. This information can be obtained from the Groundwater Mapping website, <http://gwmap.rsgis.msu.edu>.

Registering Pumps

Farms that should have reported in the past but have not need to register their pump(s) by February 1, 2009 to ensure that their water use is compiled in the Water Withdrawal Assessment Tool. It is assumed that those pumps that are in use prior to February 1, 2009 are not causing an adverse environmental impact. To register a pump, download a new water withdrawal registration form from the MDA website, <http://www.michigan.gov/mda>, under Water Use Reporting (Reporting Form box). By registering the pump(s) used on your farm, you are not reporting your annual water use but simply stating that you have a large capacity pump or combination of pumps with a large capacity. You still will need to report your 2008 annual water use by April 1, 2009. If you are registering a new pump you will need to download a water reporting form from the MDA website. After this year MDA will send you a form at the end of each year.

For more information on water use reporting or registering a pump contact your local MSU Extension office, Groundwater Technician, or Abigail Eaton 517-241-3933, eatona@micigan.gov.
Industry Professionals’ View—2008 Michigan Dairy Industry Survey

A recent Michigan State University Extension Dairy Team survey sought input from dairy producers and allied industry professionals on their priorities. Questions addressed industry, research, educational needs, and other issues. This article summarizes how allied industry professionals perceive industry priorities as well as farmers’ and their own educational needs.

Last winter the Michigan State University Extension Dairy Team conducted an industry-wide survey to obtain stakeholder input. The October issue of the Michigan Dairy Review reported on industry priorities and educational needs from the participating farmers’ points of view. This article outlines how allied industry professionals perceive industry priorities as well as farmers’ and their own educational needs.

Michigan dairy educators put together a list of allied industry professionals serving dairy farmers and the dairy industry in the state. Surveys were sent to 480 veterinarians, feed company employees (sales representatives and nutritionists), independent dairy nutritionists, herd management consultants, and feed company employees (34.8%). Table 1 shows the number of farms and cows with which the respondents work.

Industry Priorities and Concerns

Similar to dairy farm owners and operators, allied industry professionals were asked to rate 12 items according to the priority each topic should receive from the Michigan dairy industry. On a scale from 1 (very low priority) to 5 (very high priority), respondents gave the highest priority to two policy issues with median ratings of 5.

- Communicate to consumers about safety of milk products and technologies used
- Ensure continuation of Right to Farm program

Priority items with median ratings of 4 (high priority) were reached by nine issues.

<table>
<thead>
<tr>
<th>Number of Cows Worked with</th>
<th>Percentage of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000 or less</td>
<td>10.2</td>
</tr>
<tr>
<td>1,001-5,000</td>
<td>26.0</td>
</tr>
<tr>
<td>5,001-10,000</td>
<td>12.6</td>
</tr>
<tr>
<td>10,001-20,000</td>
<td>21.3</td>
</tr>
<tr>
<td>More than 20,000</td>
<td>29.9</td>
</tr>
</tbody>
</table>

Table 1. Allied Industry Respondents by Farms and Number of Cows with Which They Worked.

- Increase legislators’ knowledge of agriculture
- Promote the value of the dairy industry in Michigan’s economy
- Maintain adequate access to water resources for agriculture
- Inform the public about current farming practices
- Increase dairy product promotion activities and education, especially targeted to youth
- Promote availability of career opportunities in agriculture

Vera Bitsch
Dept. of Agricultural, Food, and Resource Economics

Kathy Lee
Extension Dairy Educator
Northwest Lower Michigan

Ted Ferris
Dept. of Animal Science

Dean Ross
Extension Dairy Educator
Southeast Michigan
Develop more leaders within the dairy industry
Work with government to enhance plans to deal with potential foreign animal disease outbreaks
Work with legislators to fund dairy industry initiatives

The two very high priority items also received median ratings of 5 by farm owners and operators. A median rating of 5 signifies that at least 50% of the respondents rated this item as a very high priority. All items are ordered according to their average ratings, starting with the highest. Overall, the differences between the average ratings of dairy farm owners and operators and the ratings of allied industry professionals were minor. The top five items are the same for the two groups. One exception, “Ensure continuation of Cooperatives Working Together (CWT) program,” was rated significantly higher by farm owners and operators, but received a median rating of only 3 (medium priority) by allied industry professionals.

Allied industry professionals also were asked to rate the importance of 21 items to the viability of Michigan’s dairy industry. On a scale from 1 (not important) to 5 (very important), two items received median importance ratings of 4.5.

Dairy farmers demonstrating environmental stewardship
Improving public understanding of animal welfare

Additionally, 17 items received median ratings of 4.

Science-based environmental regulations
Dairy industry being proactive on environmental issues, including working actively with government agencies
Taking advantage of globalization by increasing dairy exports
Increasing legislators’ understanding of the tradeoff between the cost and benefits of complying with regulations
Consumer/public acceptance of scientific information
Dairy farmer involvement in the legislative process and representation in regulation development
Methods to process manure, including renewable fuel (e.g., methane digesters)
New dairy products to increase milk utilization
Greater effort and funding for food safety and inspection programs including imported foods
Improving production efficiencies
Methods to improve disease resistance
Traceability of agricultural products to their origin to improve food safety
Timely access to trained Comprehensive Nutrient Management Plan (CNMP) service providers

Assessment of dairy farming’s impact on environmental quality
Methods to reduce odor and air pollutants
Adopting alternative energy technologies
Legal advice on environmental and general agricultural regulations from lawyers specialized in agricultural law

As with the priority items, dairy farm owners and operators and allied industry professionals rated the industry viability items similarly. The item with the largest difference in average ratings was “Science-based environmental regulations,” rated significantly higher by allied industry respondents.

Allied industry professionals were then asked to rate their concerns for the dairy industry, on a scale from 1 (not a concern) to 5 (great concern). Overall, industry concern items were again rated similarly by farm owners and operators and allied industry professionals. Twelve out of thirteen industry concern items received median ratings of 4 by the industry professionals.

Public image of agriculture
Food imports from less regulated countries
Availability and market/consumers’ acceptance of production technologies, e.g., rBST, antibiotics
Consumer interpretation of dairy product label, e.g., hormone-free, antibiotic-free, rBST-free
Availability of dairy veterinarians
Farm transfer to the next generation
Loss of farm land due to urban encroachment
Successfully eradicating TB in Michigan
Immigration legislation
Farmers planning for and meeting changing state and federal environmental regulations
Availability of farm labor
Farm business growth to improve quality of life

“Food imports from less regulated countries” was rated as less of a concern by allied industry professionals. On the other hand, “Immigration legislation” and “Availability of farm labor” were rated as higher concerns by the allied industry respondents compared to dairy farm owners and operators. One item, “Agro-terrorism and bio-terrorism,” received only a median rating of 3.5 by allied industry professionals, but the difference between the two groups is not significant.

Education and Training Needs – Allied Industry Professionals

Allied industry professionals were asked to rate their knowledge, education, or training needs. On a scale from
1, indicating no need for education and training in that area, to 5, indicating a lot of need for education and training in that area, allied industry professionals rated most educational items with median ratings of 4 for themselves.

**Nutrition**

**Reproduction**

**Herd records**

**Animal health**

**Business and financial management**

**Udder health and milk quality**

**Environmental regulation and management**

Human resource management and genetics received median ratings of 3.

**Education and Training Needs – Dairy Producers and Managers**

Allied industry professionals also were asked to indicate their perception of knowledge, education, and training needs of dairy producers and managers on a scale from 1 (none) to 5 (a lot).

**Herd Management Needs.** Twenty-one of the 26 herd management items received median ratings of 4 by the industry professionals.

- Fresh cow management
- Calf management
- Effective strategies for getting cows pregnant
- Foot health and lameness
- Troubleshooting mastitis and high somatic cell count
- Best management practices for vaccinations
- Cow comfort, stall and bedding systems
- Impact of stocking density and facility design on production, reproduction, and health
- Impact of heifer raising methods on performance
- Identify bottlenecks to improving herd performance
- Record analysis and monitoring production, health, and reproduction
- Reducing the use of antibiotics through best practices
- Quality, digestibility, and production of feeds
- Increasing cow longevity
- Dry cow management
- Farm biosecurity protocols for farm visitors and purchased animals
- Choosing alternative feeds based on feeding value and profitability

With one exception (Lactating cow management), allied industry professionals rated the herd management knowledge, education, and training needs of dairy producers and managers higher than did the farm owners and operators. The highest differences in ratings occurred at “Farm biosecurity protocol for farm visitors and purchased animals,” “Impact of stocking density and facility design on production, reproduction, and health,” and “Record analysis and monitoring production, health, and reproduction.” With the exception of biosecurity protocols, which was rated one of the bottom five items by farm owners and operators, the items receiving the lowest ratings were the same for both groups.

**Environmental Management Needs.** All six environmental management items received median ratings of 4 by the professionals, indicating a high perceived education need.

- Reducing the potential for manure runoff from fields, farm buildings, and lots
- Building good relations with non-farm neighbors
- Current regulations and environmental laws
- Using manure as a fertilizer (e.g., application rates)
- Michigan’s Agriculture Environmental Assurance Program (MAEAP)
- Handling dead animal carcasses, including composting

Farm owners and operators saw only medium needs for knowledge, education, and training for four of these six topics.

**Farm Business Management and Finance Needs.** Sixteen out of the 20 farm business management and finance items received median ratings of 4, signifying high educational needs of farm owners and operators as perceived by the allied industry respondents.

- Use of records to improve financial decisions
- Calculating cost of production
- Profit maximization strategies
- Financial management skills for dairy farmers
- Planning and financing business transfer to the next generation
- Planning for business growth
- General farm business management
Effectively working with the on-farm management team
Use of financial ratios and benchmarks
Contracting farm inputs
Use of partial budgeting
Evaluation of farm enterprises
Milk marketing and price risk management
Effectively working with consultants
Leadership development and training
Contractual agreements with service providers

The same five items were rated into the top five by both groups, albeit given more importance by the allied industry professionals than by the farm owners and operators.

Human Resource Management Needs. Allied industry professionals rated 15 items reflecting the human resource management knowledge, education, and training needs of dairy producers and managers.

Communicating with employees
Training employees
Communicating with family members involved in the farm
Motivating employees
Communication training for employees
Ensuring job satisfaction and retention of employees
Managing Latino labor, cultural understanding
General human resource management
Hiring quality employees
Developing effective incentives for employees
Training materials in Spanish for employees
Communicating dairy tasks in Spanish
Developing wage/benefit package for employees
Terminating employees and avoiding legal liability
Immigration legislation and background

One item (English language skills for employees) was left out of their questionnaire. All items received median ratings of 4, signifying that respondents saw high needs for knowledge, education, and training for dairy producers and managers in this area. Both groups rated two communication items (“Communicating with family members involved in the farm,” “Communicating with employees”) and “Motivating employees” among the top four items. However, the human resource management field shows the largest rating differences between the two groups. This could be an indication that allied industry professional respondents are more likely to work with medium-sized and larger farms than with small farms that do not hire employees or only hire family members and as a result view human resource management as more important.

Conclusions

Despite a general tendency to rate industry priorities and concerns similarly, 20 out of 46 items were rated significantly different by allied industry professionals and dairy farm owners and operators. Items rated significantly higher and therefore viewed as more important by dairy farm owners and operators are the following:

- Ensure continuation of Right to Farm program
- Food imports from less regulated countries
- New dairy products to increase milk utilization
- Increase dairy promotion activities and education, especially targeted to youth
- Work with government to enhance plans to deal with potential foreign animal disease outbreaks
- Ensure continuation of Cooperatives Working Together (CWT) program

Items rated significantly higher by allied industry professionals are the following:

- Dairy farmers demonstrating environmental stewardship
- Science-based environmental regulations
- Public image of agriculture
- Dairy industry being proactive on environmental issues, including working actively with government agencies
- Consumer/public acceptance of scientific information
- Availability and market/consumers’ acceptance of production technologies
- Methods to process manure, including renewable fuel
- Promote availability of career opportunities in agriculture
- Immigration legislation
- Develop more leaders within the dairy industry
- Assessment of dairy farming’s impact on environmental quality
- Timely access to trained Comprehensive Nutrient Management Plan (CNMP) service providers
- Methods to reduce odor and air pollutants
- Availability of farm labor

With respect to dairy producers’ and managers’ knowledge, education and training needs, allied industry professionals rated most items higher than farm owners and operators. Both groups rated the herd management items most similar. For environmental management items, business management and finance items, and human resource management items the differences between both groups are increasingly larger. Allied industry professionals work with multiple farms with different management styles and needs and conclude overall that there
is a high need for knowledge or training with respect to many aspects of dairy farming beyond herd management.

Some of the additional questions the industry survey sought to answer are how farmers and other industry participants would like to receive information and training and what role(s) MSU Extension should play in the industry. A future issue of MDR will report on these results.

Acknowledgements
This project was supported financially by Michigan State University Extension (MSUE), Dairy Farmers of America, GreenStone Farm Credit Services and the Michigan Milk Producers Association. We wish to thank those producers, family members, employees, and allied industry professionals who took the time to complete the survey and the MSUE Dairy Team members, in particular survey team member Mike McFadden, for their support.

Environmental Management

Outside Wintering Lots: Capture Fertilizer Value of Manure and Protect Surface Waters

Natalie Rector
Extension Manure Specialist

Outside wintering lots for dairy heifers, young stock and steers will accumulate valuable manure nutrients. Recycling those nutrients into your crops and pastures is like money in the bank and will lessen your risk of runoff when spring arrives.

The very nature of outside lots implies that the livestock will congregate— and defecate— in one area, as well as generally destroying vegetation and compacting soil. Melting snow and spring rains can potentially wash an entire winter’s worth of nutrients off site. A determined manager can capture these nutrients for crop production.

Right to Farm (RTF) guidelines dictate that runoff containing manure nutrients is not to leave the owner’s property and should never reach surface waters. Properly locating a wintering area is the first step to avoiding both. Temporary fencing can restrict animals to areas in a pasture that are farthest from surface water and not sloped toward neighbors, roads, ditches or streams, and/or areas that naturally provide vegetated buffer distances between the animals and any other surface feature. The greater the distance this runoff would have to move over adjoining pasture land or crop fields before it reaches surface water, the greater the chance that the nutrients will settle in the farmland, thereby benefitting future crop growth rather than contaminating surface waters.

There are two extremes that are the best options for overwintering sites. One is to provide the livestock a large amount of land and move the feed and water to different locations in the field throughout the season. This method forces animals to distribute manure and its nutrients over the area. This can be a daunting task on chilly winter days. If you choose to do this, it’s important to stay dedicated to the process throughout the season.

One could avoid excessive nutrient build up at a winter feeding area by moving the feeding area every 8-10 days. Be sure to exclude the cattle from areas adjacent to surface waters or swampy areas with temporary fencing. At a minimum, one should rotate winter feeding areas each year and reseed them.

Another option is to confine animals to a much smaller area, and feed and water them in the same area all winter. This will concentrate the manure nutrients in a small enough area that they can be scraped up and reallocated to crop and pasture lands before a spring thaw. Keep this area as small as possible to reduce soil compaction and loss of vegetation.

Let’s consider 40 750 lb heifers on a lot for 180 days. They can generate enough potassium to fertilize 25 acres with the equivalent of 60 pounds of K₂O per acre. That’s more than $1,000 worth of fertilizer. These young stock will generate less phosphorus than a milking herd but will generate close to $500 worth of phosphorus. Although some of the nitrogen will volatilize, cold weather reduces losses, so there is potentially $1,000 worth of this nutrient that can be utilized elsewhere. The three nutrients add up quickly at 2008 fall prices.
Bovine Leukosis Virus Update I: Prevalence, Economic Losses, and Management

Bovine Leukosis Virus (BLV) can lead to losses that include increased heifer replacement costs, loss of income from condemned carcasses of cull cows, reduced fertility and decreased milk production. Larger herds are more likely to test positive for BLV. Common causes include shared syringes and, to a lesser extent, rectal palpation. The average annual cost in a 50% prevalence herd was nearly $6,400 per 100 milking cows. This article offers an introduction on implementing a BLV management program, including how to test prevalence.

Ron Erskine
Lorraine Sordillo
Dept. of Large Animal Clinical Sciences

Bovine leukemia is a cancerous disease caused by Bovine Leukosis Virus (BLV). This is a retrovirus that infects beef and dairy cattle, targeting lymphocytes, a type of white blood cell. These cells are part of the immune system. Infection with the virus most often does not cause any clinical signs, however, about 30% of the infected animals develop a lymphocytosis, or abnormal increase in lymphocytes in the blood. This is sometimes referred to as “leukemia” although it is different from most forms of human leukemia.

Effects of BLV

The leukemia does not cause any clinically apparent change in most cows. It is estimated, however, that 1 to 5% of all infected cattle, not just leukemic cattle, develop malignant tumors know as “lymphosarcomas”. Typically, this is a disease of adult cattle, although a juvenile form of lymphosarcoma can occur in younger animals. Cattle showing these signs may display protruding eyeballs, weight loss, enlarged lymph nodes, gastrointestinal obstructions, paralysis in the hind limbs, and/or infertility because of tumors in the uterus.

Direct BLV losses to the dairy producer include increased replacement costs, loss of income from condemned carcasses of cull cows, and the inability to export cattle, semen and embryos to countries that maintain BLV control programs, such as the European Union. Further losses may include reduced reproductive efficiency and decreased milk production (1, 2).

BLV is primarily transmitted in the blood of infected cattle, but to a lesser extent may be transmitted in saliva, semen, and milk. Thus, management practices that result in direct exposure of blood of infected cows to uninfected cows may increase the prevalence of infection within a herd. The use of common needles, blood contaminated syringes, and drug vials are the primary cause. Rectal palpation may also play a significant role. To a lesser degree, colostrums, cross-placental transmission, and perhaps flies are possible contributors to the spread of BLV.

Diagnosing BLV infected cattle can be done by simply testing serum for virus-specific antibodies. Care should be taken in interpreting positive results in young calves that are under six months as they may have positive antibodies from the dam through colostrum feeding. It is also difficult to predict which seropositive cows will eventually develop the lymphosarcoma form of the disease, although it is likely that cows that have developed a persistent leukemia are at greater risk. Therefore, testing serum to determine infected cows is not a useful tool in making culling decisions unless the cow is showing clinical signs consistent with lymphosarcoma, and has an elevated lymphocyte count in her blood.

Prevalence

The USDA conducted studies of BLV in dairy cattle for 1996 and 2007 through the National Animal Health Monitoring System (NAHMS) (<http://nahms.aphis.usda.gov>). In 1996, over 1,000 dairy operations participated in the study. At least one BLV infected cow was found in 89% of the farms. Prevalence of infected cows within each herd varied widely, but an average of 40% of the cows were infected in the Midwest. Both the 1996 and 2007 study suggested that larger herds were more likely to test positive for infection, and have a higher percent of infected cows. The 2007 NAHMS study did not report individual animal infection prevalence within herds. However, on an anecdotal basis only, the authors have screened several herds in the course of research projects and have determined that BLV prevalence in Michigan dairies may be at least 70 to 80% of the cows. If this is representative of a wider number of herds, then there has been a near doubling in average herd prevalence since the 1996 NAHMS study. How could this be possible?

The Michigan dairy industry has undergone monumental changes in the last 12 years. One of the most profound changes has been an increase in average herd size. For many expanding herds, this has resulted in commingling of animals from different farm sources. Additionally, the use of drug and vaccine injections has intensified, particularly in light of estrous synchronization programs, so it is likely that many cows are receiving substantially more injections in their lifetime than a decade ago. Likewise, many herds have increased the number
of palpation exams for pregnancy diagnosis. If the virus is shed in saliva, mixed rations in common feed bunks offer an opportunity for transmission and, finally, it is typical for cows to be moved between a variety of milking/feeding groups which can further increase the probability of exposures between infected and non-infected cows.

Economic Losses
The NAHMS study determined that herds with BLV produced $59 less in annual production per cow, or 3% less milk, than non-BLV herds (1). However, this figure can vary depending on the prevalence of infection within a herd, and herds with a higher prevalence of infection are likely to sustain greater economic losses. In a Virginia study, the average cost of a case of lymphosarcoma was over $400, and in a herd with 50% of cows seropositive, the rate of lymphosarcoma was about 2 cases per 300 milking cows (Rhodes et al, 2003). The average annual cost in a 50% prevalence herd was nearly $6,400 per 100 milking cows.

Management
Given the high prevalence of BLV infection in most herds, and the relatively benign nature of infection in most cows, it would not be economical to test and cull positive cows. Before starting a BLV management program, a herd should have an estimate of the prevalence of infected cows within the herd. Serum samples from a representative number of cows (25% for small herds, between 5 to 10% for larger herds) should be collected and submitted for testing. Another method that dairy managers can use to estimate the cost of the disease in their herd is the number of cows that are condemned each year because of lymphosarcoma. This information is reported by federal veterinarians to the seller of the cattle, but is easier to attain for herds that take their own cattle directly to market. It is likely that some lymphosarcoma cows go undiagnosed on many farms, presenting as a poorly performing cow, or one that won’t get up. A thorough examination by a veterinarian, including a blood count and differential, augmented by a field necropsy, may help identify losses from “unknown” BLV cows.

Dairy producers have to balance efficiency of labor with benefits gained from any management practice. Following are key management practices that are proposed to reduce the prevalence of BLV in a herd:

- Use separate needles and discarding syringes that have been contaminated with blood. This includes maintaining a “clean” needle in a multiuse drug vial.
- Identify BLV positive cows and change palpation sleeves after examining a BLV positive cow and before examining a negative cow.
- Feed colostrums and milk from BLV negative cows only. Alternatively, feed milk replacer rather than milk, and pasteurize colostrum.
- Use electric or gas “burning” dehorners rather than gouging equipment.
- Clean all tattoo and ear tag equipment before each use.
- When practical, separate BLV positive animals from BLV negative animals. This may be difficult on most farms.

In a report from Virginia, a dairy herd that followed the above guidelines (but did no segregation or culling of BLV infected cattle) for two years reduced their prevalence throughout all ages of heifers before calving and reduced an initial prevalence of 44% to 17% (3). The MSU Dairy followed a similar program for nearly ten years (including segregation), and decreased their prevalence from 55% in lactating cattle to 35%, and currently have less than 10% BLV positive heifers. In the Virginia study, the cost to benefit ratio of the test and manage program was better than 3:1, or $3 gained for every $1 spent (2).

Summary
Almost all U.S. dairy herds, including those in Michigan, have BLV. However, the prevalence of infected cows varies from herd to herd. In a herd with few BLV infections, the cost of testing cows and managing an active BLV eradication may seem expensive; however, the prevalence of infection is rising in many herds, and in some, may be greater than 90% of the cows. Depending on losses from lymphosarcoma cows, and the prevalence of BLV infected cows, some herds may want to reconsider the cost of controlling this disease. The goal is usually not to eradicate BLV (unless the herd actively participates in the sale of stock and genetic material) but to reduce the prevalence to a more economically viable level.

References
Environmental Stewardship of Dairy Producers in MAEAP

This article presents the results of a survey of Michigan livestock producers who participate in the Michigan Agriculture Environmental Assurance Program (MAEAP). In general, dairy producers agreed that MAEAP participation is effective in conveying that they are responsible stewards of the environment and all dairy producers agreed that due to their involvement in MAEAP, they can better manage their farm for environmental and regulatory matters.

Abdul Abdulkadri  
Steve Miller  
Center for Economic Analysis  
Dept. of Agricultural, Food and Resource Economics

Sandra Batie  
Satish Joshi  
Dept. of Agricultural, Food and Resource Economics

Most livestock farmers are aware of the growing interests shown by stakeholders such as regulators, food processors, consumers, neighbors and environmental activists in their operations, and many are themselves making environmental stewardship a high priority in the management of their operations. Results from a recent survey of dairy farmers in Michigan by the Michigan State University Extension Dairy Team (1) suggest that Michigan dairy producers are proactive about their environmental stewardship and are interested in demonstrating this stewardship to government entities and others. The results also indicate a willingness of producers to seek information on improved environmental stewardship practices as well as on current environmental regulations. One avenue to achieve these priorities is through participation in the Michigan Agriculture Environmental Assurance Program (MAEAP).

This article presents the results of a survey of Michigan livestock producers who participate in MAEAP. The article shows that MAEAP-verified dairy producers identified tangible benefits to their operations as a result of participating in MAEAP. Our findings offer insights for the realization of the dairy industry’s priorities as they relate to environmental stewardship and regulation and provide evidence that suggests that these priorities are achievable when producers are MAEAP-verified.

MAEAP

MAEAP is a voluntary program that affords farmers the opportunity to be proactive about their environmental stewardship. It provides education and on-farm risk assessment in order to equip the farmer to implement an approved management plan to address identified risks. MAEAP covers livestock, farmstead, and cropping systems and most producers participating in MAEAP strive to become MAEAP-verified. For livestock systems, MAEAP verification is attained after an independent farm inspection to confirm that the producer is following and implementing their individually approved Comprehensive Nutrient Management Plan or CNMP (2). Currently there are 209 MAEAP-verified livestock producers. Of these, 112 also hold a Michigan Department of Environmental Quality (MDEQ)/National Pollutant Discharge Elimination System (NPDES) permit because they are Concentrated Animal Feeding Operations (CAFOs).

Results of MAEAP Survey

As part of an ongoing research study at Michigan State University (MSU), a pilot survey of MAEAP-verified livestock (dairy, beef, hogs, poultry/turkeys, sheep/goats, and horses) producers was carried out in the summer of 2008. This survey sought to gather information on producers’ motivation for participating in MAEAP and the benefits they derive from participation. The findings of this survey offer insights into the attainment of the dairy industry priorities as they relate to environmental stewardship and regulation. These findings are summarized in this article.

Survey questionnaires were mailed to 197 MAEAP-verified livestock producers and 49% returned completed surveys. A total of 95 surveys were usable in the data analysis.

Twenty-two percent of the respondents (21 farmers) had dairy operations. These 21 dairy operations ranged in size from 40 to 5000 dairy cows with 43% of them having an inventory of 500 or more dairy cows. Only 28% of dairy producers in the sample indicated that they currently operate under a MDEQ/NPDES permit for CAFOs compared to 52% of non-dairy livestock producers who so indicated.

Respondents were asked to rate different factors in terms of how important they are in their decision to participate in MAEAP. Factors listed on the survey, relating particularly to environmental stewardship or regulation, included the following:

- ensuring that my farm attains environmental standards for future generations
- desire to farm in an environmentally-friendly manner
conforming to current regulatory standards so farm can remain in agriculture for the future
prefer to be involved in a voluntary program now rather than wait for potential future regulations
neighborhood concerns or pressure

The percentages of dairy producers and other livestock producers who rated each of these factors as being important or very important in their decision to participate in MAEAP were compared. In all cases, the proportion of dairy producers who were motivated by each of these factors was not statistically significant from that of other livestock producers. All surveyed dairy operators felt that it is important or very important for them to participate in MAEAP in order to ensure that their farm attains environmental standards for future generations. Similarly, all surveyed dairy operators felt that it is important or very important for them to participate in MAEAP because of their desire to farm in an environmentally-friendly manner. Respondents also attached a high level of importance to MAEAP participation in helping them to conform to environmental regulations for the future success of their farm operation.

The need to communicate effectively with the legislature and government agencies featured prominently among the top priorities of Michigan dairy producers on an earlier survey (1). In a similar manner, opinions of MAEAP-verified livestock producers were sought on the current survey, as to the effectiveness of MAEAP participation in communicating that livestock producers are responsible stewards of the environment to different stakeholders including the state legislature, Michigan Department of Agriculture (MDA), MDEQ, food processors, environmental activists and farmers’ neighbors. Again, the percentages of dairy operators and other livestock operators who agreed or strongly agreed that “MAEAP participation is effective in communicating that livestock producers are responsible stewards of the environment” were compared. In general, high proportions of dairy producers and other livestock producers, respectively, who were surveyed, agreed or strongly agreed that MAEAP participation is effective in communicating that livestock producers are responsible stewards of the environment.” were compared. In general, high proportions of dairy producers and other livestock producers, respectively, who were surveyed, agreed or strongly agreed that MAEAP participation is effective in conveying to the MDA (89% vs. 95%) and the state legislature (78% vs. 79%) that they are responsible stewards of the environment, although there is a wide gap between the proportion of dairy producers (67%) and other livestock producers (78%) who thought that MAEAP is effective in communicating their environmental stewardship to their neighbors. On the other hand, greater proportions of dairy producers than other livestock producers thought that MAEAP participation is effective in conveying their environmental stewardship to MDEQ (61% vs. 41%) and environmental activists (37% vs. 28%). Just about half of dairy and other livestock producers thought that MAEAP is effective in conveying to food processors that they are responsible stewards of the environment.

Several statements on potential benefits of MAEAP were listed on the survey instrument and respondents were asked to indicate their level of agreement with these statements. A sample of these statements, relating to either short-term or long-term benefit of MAEAP, is as follows:

Short-term Benefits
- MAEAP reduces my liability if there is an environmental accident on my farm.
- The benefits of MAEAP participation exceed the costs for my farm.
- MAEAP participation will allow me to be responsive to changes in the market for livestock products dictated by environmental concerns.
- MAEAP participation is helping me to differentiate or brand my products in the marketplace.

Long-term Benefits
- Due to my participation in MAEAP, I have made changes to my livestock operation that protect the environment.
- Due to my involvement in MAEAP, I can better manage my farm for environmental and regulatory matters.
- By being a MAEAP participant, I will be more prepared for any future regulatory changes.
- The existence of MAEAP may help preempt future regulation of livestock producers.
Figure 1 shows the results for surveyed dairy producers and other livestock producers for the four statements pertaining to short-term benefits. The difference in the percentages of respondents between the two groups who agreed or strongly agreed with each of the statements was not statistically significant. There was low agreement among producers on the statement about MAEAP participation helping producers to differentiate or brand their products in the market place; on the other hand, more than 50% of dairy and other livestock producers surveyed were in agreement that MAEAP reduces their liability if there is an environmental accident on their farm, that the benefits of MAEAP participation exceed the costs for their farm, and that MAEAP participation will allow them to be responsive to changes in the market for livestock products dictated by environmental concerns.

Figure 2 shows a clearer and statistically significant distinction between dairy producers and other livestock producers on their perception of the long-term benefits of MAEAP. All dairy producers agreed or strongly agreed that, due to their participation in MAEAP, they have made changes to their operations that protect the environment compared with 82% of other livestock producers who did. Similarly, all dairy producers agreed or strongly agreed that due to their involvement in MAEAP, they can better manage their farm for environmental and regulatory matters compared to 79% of other livestock producers who so indicated. A higher percentage of dairy producers (79%) compared to other livestock producers (53%) agreed or strongly agreed that the existence of MAEAP may help preempt future regulation of livestock producers. Only on the issue of farmers being more prepared for any future regulatory changes did similar proportions of dairy (90%) and other livestock (86%) producers agree or strongly agree that MAEAP participation will enable them to be prepared.

Conclusions

Results of the MAEAP pilot survey indicate that all surveyed MAEAP-verified dairy producers were motivated by the need to ensure that their farm attains environmental standards for future generations and by the desire to farm in an environmentally-friendly manner. In addition, high proportions of surveyed MAEAP-verified dairy producers agree that MAEAP participation is effective in communicating that they are responsible stewards of the environment to the Michigan Department of Agriculture and the Michigan Department of Environmental Quality as well as the Michigan state legislature. These desires for environmental stewardship and farm viability as well as a realization of active interaction with government agencies match the priorities identified in the 2008 Michigan dairy industry survey (1). Our results also provide evidence that MAEAP-verified dairy producers perceive benefits that are long-term in nature. Such long-term benefits include producers making changes in their dairy operation that protect the environment and acquiring improved management skills resulting in better environmental management of their farms. Therefore, participating in MAEAP provides potential for dairy producers to achieve their industry priorities relating to environmental stewardship.

Acknowledgements

The MAEAP pilot survey was funded by the Elton R. Smith Endowment in the MSU Department of Agricultural, Food and Resource Economics. We wish to thank livestock producers who participated in the survey, Jan Wilford, Natalie Rector, Dale Rozeboom, Wendy Powers and Gary Trimner.

References

Herd Health

Effectiveness of Test and Remove for Bovine Tuberculosis Eradication in Herds

In the past, herd depopulation has been the primary technique for combating bovine tuberculosis (bTB), but larger herd sizes, decreased indemnity funding, and animal welfare concerns make test and remove (T & R) methods worth reconsidering. This article examines a herd that underwent T & R to demonstrate that T & R provides an effective, practical and economical way to handle herds infected with bTB, and that policies that do not discourage T & R procedures are needed.

Phil Durst
Extension Dairy Educator
Northeast Michigan

Bovine tuberculosis (bTB) was a significant risk to the health of both people and cattle through the early 1900s in this country. In 1917, the Cooperative State-Federal Tuberculosis Eradication Program began and through it, bTB prevalence was brought to very low levels by the 1990s. Since then, however, we have seen sporadic cases of bTB and currently four states; California, New Mexico, Minnesota and Michigan are or have zones that have a classification that is less than TB-Free.

In the efforts to eradicate bTB in the US, herd depopulation has been favored because it eliminates the uncertainty of determining which animals are infected and therefore the possibility that some infected animals survive and will be able to spread the disease. Diseases caused by Mycobacterium species such as bTB and Johne’s Disease are difficult to detect with high reliability in individual animals.

Yet, as herds became larger, and as indemnity dollars became more limited, questions have been raised about whether whole-herd depopulation is a wise use of tax dollars, whether it can withstand animal welfare questions, and whether it is more effective than removal of test-responsive animals from a herd in which bTB has been diagnosed.

Study of Test and Remove Herds

At the 2007 meeting of the United States Animal Health Association (USAHA), the author made a presentation to the TB Committee on Michigan’s experience with Test and Remove (T & R) herds. He detailed the outcomes of five dairy herds in northeast Michigan that either had or were undergoing a T & R protocol for bTB. As a result of that presentation, a subcommittee was established by the chair of the USAHA TB

Table 1. US Dairy Herds That Have Gone through bTB Test & Remove Protocols since 1985, the Year of Initial Diagnosis, Approximate Number of Cattle and the Number of Head Confirmed with the Disease Initially and Totally

<table>
<thead>
<tr>
<th>Farm</th>
<th>State</th>
<th>Year</th>
<th>Cows</th>
<th>Total pos.</th>
<th>Head initially pos.</th>
<th>Current status</th>
</tr>
</thead>
<tbody>
<tr>
<td>DV</td>
<td>TX</td>
<td>1985</td>
<td>1200</td>
<td>16</td>
<td>2</td>
<td>EPMB¹</td>
</tr>
<tr>
<td>RG</td>
<td>TX</td>
<td>1985</td>
<td>1400</td>
<td>13</td>
<td>2</td>
<td>EPMB</td>
</tr>
<tr>
<td>DD</td>
<td>TX</td>
<td>1985</td>
<td>370</td>
<td>4</td>
<td>1</td>
<td>EPMB</td>
</tr>
<tr>
<td>ID</td>
<td>TX</td>
<td>1990</td>
<td>3700</td>
<td>9</td>
<td>3</td>
<td>EPMB</td>
</tr>
<tr>
<td>ED</td>
<td>TX</td>
<td>1991</td>
<td>280</td>
<td>1</td>
<td>1</td>
<td>EPMB</td>
</tr>
<tr>
<td>LO</td>
<td>TX</td>
<td>1992</td>
<td>160</td>
<td>2</td>
<td>2</td>
<td>EPMB</td>
</tr>
<tr>
<td>WD</td>
<td>TX</td>
<td>1993</td>
<td>600</td>
<td>4</td>
<td>4</td>
<td>Released</td>
</tr>
<tr>
<td>GD</td>
<td>NM</td>
<td>1994</td>
<td>7300</td>
<td>1</td>
<td>1</td>
<td>Released</td>
</tr>
<tr>
<td>BD</td>
<td>TX</td>
<td>1996</td>
<td>5000</td>
<td>2</td>
<td>2</td>
<td>EPMB</td>
</tr>
<tr>
<td>TD</td>
<td>MI</td>
<td>2000</td>
<td>150</td>
<td>1</td>
<td>1</td>
<td>Released</td>
</tr>
<tr>
<td>KD</td>
<td>MI</td>
<td>2000</td>
<td>100</td>
<td>8</td>
<td>8</td>
<td>Quarantine</td>
</tr>
<tr>
<td>MD</td>
<td>NM</td>
<td>2002</td>
<td>1500</td>
<td>2</td>
<td>2</td>
<td>Quarantine</td>
</tr>
<tr>
<td>RD</td>
<td>MI</td>
<td>2002</td>
<td>40</td>
<td>1</td>
<td>1</td>
<td>Released</td>
</tr>
<tr>
<td>DD</td>
<td>MI</td>
<td>2002</td>
<td>240</td>
<td>1</td>
<td>1</td>
<td>Released</td>
</tr>
<tr>
<td>HD</td>
<td>MI</td>
<td>2003</td>
<td>70</td>
<td>1</td>
<td>1</td>
<td>Released</td>
</tr>
</tbody>
</table>

¹ El Paso Milkshed Buyout: 2002 - 2005
committee on Test and Remove Policy Assessment and the author was named the chair of that subcommittee.

The subcommittee is composed of regulatory and university veterinarians and researchers and producer representatives from all states directly impacted by bTB. The subcommittee compiled data from all US herds that had gone through T & R protocols for bTB since 1985, the year of the outbreak in the El Paso, Texas area. While more herds were diagnosed as bTB infected during this period (in the period FY 1990-2008, there have been 77 affected beef herds and 44 affected dairy herds) only 15 herds in the US have undergone T & R since 1985, some of which were subsequently depopulated in the El Paso Milkshed Buyout (EPMB). The list of those herds, the year of initial diagnosis, approximate number of cattle and the number of head confirmed with the disease initially and totally is shown in Table 1.

An important observation is that the initial prevalence level of bTB in these herds is very low—less than 1 percent in herds greater than 200 head and less than 3 infected animals in herds of fewer than 200 head.

**Issue of Within-herd Transmission**

In 8 of the 15 herds, all bTB positive animals ever identified in the herd were diagnosed in the initial diagnostic test. That is, in just over half the T & R herds, subsequent testing did not reveal any evidence of within-herd transmission (WHT) or latent, undisclosed positive animals. All of these herds were test-negative in up to 18 whole herd tests over periods from 5 to 14 years thereafter (Table 2). Some of these herds are intact and continue to be tested annually.

In 7 of the 15 herds, bTB positive animals were subsequently diagnosed upon continued testing as part of the T & R program. Of those, six herds had animals detected within 4 years of the initial diagnosis. This is within the current quarantine period. Therefore, if all these herds had been under a herd plan that called for a minimum four year quarantine, almost all would have been detected prior to release of quarantine.

It is true that in the late 1980s, five herds in the T & R program had cattle diagnosed positive after they were released from quarantine. However, quarantine at that time, following 1980s Uniform Methods and Rules (UM&R), was as short as 14 months. Three of those herds had repeated diagnoses of positive cattle (cows and heifers) of the same DNA strain as the original infection over a period of up to 12 years. However, the total prevalence rate was still very low (less than 2%) in these herds and following the last positive animal detected, they went years and many negative WHTs without additional positive animals found. These herds were depopulated in the EPMB.

The key issue is detection of infected animals. There is still not a single test that has high enough sensitivity and specificity to identify all positive cattle. However, there have been changes in the T & R testing protocols that increase the probability of detecting any additional positive animals by

<table>
<thead>
<tr>
<th>Farm</th>
<th>State</th>
<th>Number of years since last diagnosed animal</th>
<th>Number of negative WHT since last diagnosed animal</th>
</tr>
</thead>
<tbody>
<tr>
<td>DV</td>
<td>TX</td>
<td>6.5</td>
<td>18</td>
</tr>
<tr>
<td>RG</td>
<td>TX</td>
<td>3.8</td>
<td>11</td>
</tr>
<tr>
<td>DD</td>
<td>TX</td>
<td>9.0</td>
<td>11</td>
</tr>
<tr>
<td>ID</td>
<td>TX</td>
<td>3.0</td>
<td>5</td>
</tr>
<tr>
<td>ED</td>
<td>TX</td>
<td>9.5</td>
<td>13</td>
</tr>
<tr>
<td>LD</td>
<td>TX</td>
<td>8.8</td>
<td>10</td>
</tr>
<tr>
<td>WD</td>
<td>TX</td>
<td>11.0</td>
<td>11</td>
</tr>
<tr>
<td>GD</td>
<td>NM</td>
<td>14.0</td>
<td>11</td>
</tr>
<tr>
<td>BD</td>
<td>TX</td>
<td>1.2</td>
<td>5</td>
</tr>
<tr>
<td>TD</td>
<td>MI</td>
<td>8.0</td>
<td>13</td>
</tr>
<tr>
<td>KD</td>
<td>MI</td>
<td>4.0</td>
<td>6</td>
</tr>
<tr>
<td>MD</td>
<td>NM</td>
<td>3.5</td>
<td>5</td>
</tr>
<tr>
<td>RD</td>
<td>MI</td>
<td>6.0</td>
<td>8</td>
</tr>
<tr>
<td>DD</td>
<td>MI</td>
<td>5.5</td>
<td>9</td>
</tr>
<tr>
<td>HD</td>
<td>MI</td>
<td>4.5</td>
<td>7</td>
</tr>
</tbody>
</table>

1 WHT = within herd transmission
using multiple tests, such as using gamma interferon testing in parallel with caudal fold testing (CFT) with the removal of any responders.

**Effectiveness of Test & Remove**

The data show that of the 15 herds that went through a T & R protocol, 6 have been released from quarantine and are still clear of bTB. Three of those have gone over 6 years since the last diagnosed animal. Two herds remain under quarantine and, pending a negative whole herd test in 2009, are scheduled for release from quarantine. The disease is believed to have been eliminated from these herds.

The other seven herds were depopulated in the EPMB. Before those herds were depopulated, all had been released from quarantine. Four of those Texas dairies had gone over 6 years without further diagnosed animals. It may be inferred that bTB was eliminated in these herds through T & R. Table 2 shows the number of years and number of whole herd tests that were negative since the last positive animal in these herds. While it cannot be said with 100% confidence that any of these herds were or are completely free of bTB, the confidence in their freedom is high and increases with time when testing is continued.

**Risk of Spread of bTB from Test & Remove Herds**

The January, 2005 UM&R prescribes a T & R program that keeps the herd quarantined for at least 4 years after initial diagnosis. When any subsequent animal is diagnosed, the clock resets on the quarantine period and the testing protocol. Herd plans prescribe rules for additions to herds as well as the removal of animals and products from the farm. A good herd plan should limit risks to other herds specific to the herd operation. It has not been shown that any other herd has been infected by bTB from these herds in T & R protocol whether during or off quarantine.

**Relative Cost of Depopulation vs. Test & Remove**

The costs of whole-herd depopulation have become prohibitive. Using actual expense figures over the period of 2003-2008 from New Mexico for T & R in a herd of 1500 cows where one positive animal was diagnosed in 2002 and another in 2005, the costs of T & R can be compared to what the indemnity alone would have been had this herd been depopulated. The cost of T & R can be estimated at $512,918 based on data from 2003-2008 including state and federal costs for caudal fold and gamma interferon testing, indemnity (190 head), and personnel. Conversely, a proposed herd depopulation offer (including indemnity only, no other costs such as personnel) amounts to $3,750,000. Those figures show that depopulation would have cost the government seven times more, while eliminating tremendous farm income at the same time. At the 2008 USAHA meeting, John Clifford, Deputy Administrator of USDA APHIS, said that the government can no longer afford to depopulate large herds, especially when only a few positive animals are found.

**Strengthening Test & Remove**

Test and Remove may be economically better for governments as well as economically better for the community, but is it safe enough for the cattle industry within a state and for neighboring states and trading partners? In addition, one must ask whether it is safe for people and for wildlife.

The subcommittee members believe that the answer lies in developing a strong herd plan with the owners of affected herds and then monitoring the compliance with the plan throughout the entire quarantine. While strong, the herd plan must also be practical and feasible in order to be credible and subsequently implemented by the producer. The subcommittee submitted a herd plan template to the USAHA TB Committee.

The actions required to reduce risk will depend on the nature of the risk to the herd. A thorough epidemiological investigation should be conducted to determine the risks. Every herd that is diagnosed with bTB suffered a breakdown of biosecurity that allowed the cattle to be exposed to the bacteria. Therefore, every dairy operator and herdsman in a T & R program needs to evaluate and strengthen their biosecurity practices.

**Subcommittee Conclusions**

Though only 15 herds have undergone T & R since 1985, the data examined are from more than 22,000 head of cattle in three states with 257 whole herd tests beginning with diagnosis. There were 405,659 individual animal CFTs in these herds over a period of 23 years.

Based on their examination of the data, the T & R subcommittee concluded that: 1) T & R can be effective in eliminating bTB from herds; 2) as time increases since positive animals are diagnosed in a T & R herd, confidence in having eliminated the disease increases; and, 3) safeguards can be built into herd plans to protect the industry, public and wildlife.

However, current USDA rules create a strong disincentive for states to allow T & R of infected herds. Herds are counted as affected herds throughout the 4.5-year period of quarantine. The count of affected herds is part of the definition for state/zone status and by allowing herds to go through T & R, states have put their status at risk of being downgraded. At the 2008 USAHA meeting, a policy change proposal presented by the T & R subcommittee that would reduce that disincentive was adopted by the TB Committee and the USAHA board. Clifford has indicated that USDA is seeking input for changes that would create greater flexibility in meeting program goals. USDA Listening Sessions in December, 2008 were an opportunity to hear from stakeholders.

Policies which create greater potential for T & R would not increase the risk to other herds or states, nor would it deter the US from reaching its goal of being bTB free. Rather, T & R provides an effective, practical and economical way to handle herds infected with bTB.
Right to Farm Coverage of On-farm Compost Production

An increasing number of farmers are composting manure in response to the benefits compost offers within a cropping system. The increase in composting, however, has raised questions about how far Right to Farm (RTF) coverage extends. This article explains the issues surrounding RTF, generally accepted agricultural management practices, and compost, concluding that RTF coverage extends to all farms that make compost for their own use, as long as it is managed according to GAAMPs.

Charles Gould
Extension Nutrient Management Educator
Central Region

Steve Mahoney
Michigan Department of Agriculture

The controlled biological decomposition of organic matter results in compost. Therefore by definition, manure that is not managed by generally accepted compost production standards cannot be called compost. At best it is decomposing manure.

Uses and Benefits of Compost

Compost has many uses and benefits in a cropping system. Compost encourages the formation of appropriately sized soil aggregates which protect the soil from erosion and compaction. It enhances soil fertility through the slow release of macro- and micro-nutrients, as well as improving the availability of nutrients to growing crops. Most importantly, compost helps support living biological systems by imparting soil with beneficial microorganisms that suppress or control soil-borne plant pathogens. These suppressive qualities occur in compost made with specific feedstocks for specific cropping systems. Feedstocks, in this context, refer to the organic matter used to supply the carbon and nitrogen necessary for compost production. Examples of carbon feedstocks include sawdust and straw. Examples of nitrogen feedstocks include manure and fresh grass clippings.

What Does It Mean to Have Right to Farm Coverage?

The Michigan legislature passed into law the Michigan Right to Farm (RTF) Act (Act 93 of 1981). The Michigan RTF Act requires the establishment of Generally Accepted Agricultural Management Practices (GAAMPs). These practices are written to provide uniform, statewide standards and acceptable management practices based on sound science. On a livestock farm where manure is produced, these practices are implemented through a Manure Management Systems Plan (MMSP) found in the GAAMPs for Manure Management and Utilization (commonly referred to as the Manure GAAMPs). The Manure GAAMPs can be found at <http://www.michigan.gov/gaamps>. A farmer complies with the intent of the Michigan Right to Farm Act when a MMSP is developed, implemented, and sufficient documentation is provided to prove the plan was followed.

As an increasing number of farmers are composting manure, there has been some confusion about how far RTF coverage extends, especially for farmers who: a) bring feedstocks used in compost production onto the farm, and b) sell compost to others. The purpose of this article is to clarify what coverage a farmer can expect under RTF if he/she chooses to compost manure.

Biological Treatment Method

According to the Manure GAAMPs, a biological treatment system is designed to convert organic matter, such as feed, bedding, animal manure, and other agricultural by-products, to more stable end products. Composting is listed as a biological treatment method in the Manure GAAMPs. Therefore, compost production, as a biological treatment system for manure, is part of a farm’s MMSP. Compost production practices referenced in the Manure GAAMPs are from the On-Farm Composting Handbook (NRAES-54). Farms considering composting manure should add this handbook to their library. It can be purchased from any MSU Extension office in the state.

Compost Production Scenarios

With regards to composting manure and the distribution of compost, a number of different scenarios could occur on a farm. The feedstocks used to make the compost, scale of farm operation, composting method, and final utilization of the compost will determine whether the material and activities are covered under RTF or are regulated by the Michigan Department of Environmental Quality (MDEQ) Waste and Hazardous Materials Division (WHMD) and/or Water Bureau [for farms under a National Pollutant Discharge Elimination System (NPDES) permit].

Scenario I

In general, manure generated and composted on a farm (as a form of treatment) may be used on that same farm or taken off that farm for off-site utilization at another farm under RTF. Compost use and application should follow GAAMPs recommendations.
Scenario II

Manure generated on one farm and brought to a different farm for composting (as a form of treatment) may be used on the farm where it is composted under RTF, if managed according to GAAMPs. Any distribution of the composted manure from the farming operation will be considered 'commercial composting' and subject to NREPA part 115 rules, as administered by MDEQ WHMD.

Scenario III

Similarly, yard clippings (e.g., grass clippings, leaves, small brush, as defined by part 115) brought to a farm for composting (as a form of treatment) may be used as a soil amendment on that same farm under RTF, if managed according to GAAMPs. In most cases the farm will need to have and follow a Compost Operation Plan (COP) approved by MDA. A COP includes a site plan, inventory of amount(s) of material(s) received, a description of how the materials will be composted, a description of storm water and runoff management practices, and utilization of the finished compost.

For MDA to make a GAAMPs determination under this scenario, the farm will need to:
- Submit a COP to MDA.
- Allow MDA to conduct an on-site inspection.
- Produce adequate records to document adherence to the COP and conformance to GAAMPs for Nutrient Utilization (different from the Manure GAAMPs, but found at the same web site).

Scenario IV

Yard waste brought to a farm for composting (not as a form of treatment) and distributed from that farm in any form (raw yard waste, partially composted compost, or finished compost) is considered a commercial composting facility and is solely under MDEQ jurisdiction. A farmer has no RTF coverage under this scenario.

Conclusion

RTF coverage extends to all farms that make compost for their own use, as long as it is managed according to GAAMPs. Anything beyond this designation is considered commercial composting and does not receive RTF coverage. These operations fall under the purview of the MDEQ. If a farm is used as a commercial composting site, permits may be obtained from the MDEQ. Contact your local MSU Extension office for more information about on-farm compost production.

Manure Sense

Skyrocketing energy costs and increasing fertilizer prices have farmers looking for ways to minimize their time and input costs. “Manure Sense: Making the Most with Your Manure” will discuss how farmers can find multiple ways to get more value from manure.

The meeting, to be held in three locations around the state, will feature educational information from Michigan State University (MSU) experts. Topics include composting, making energy on the farm, future opportunities in the carbon market, conserving nutrients in livestock diets, conserving manure nutrients during storage, and optimizing fertilizer and manure applications.

Manure Sense will be presented in three locations:
- Feb. 3 at the RESA Center in St. Johns.
- Feb. 17 at the Farm Bureau Building in Bad Axe.
- Feb. 25 at the Howard Miller Library in Zeeland.

The meeting will run from 10 a.m. to 3:30 p.m. at each location. The registration fee is $40 for the first person from a farm, and $20 for each additional person from the same farm or business. Lunch is free with registration. Learn more, including how to register, at <http://www.animalagteam.msu.edu>, or call Faye Watson at (517) 353-3174.

Artisan Hands-on Basic Cheesemaking Workshop

At the Dairy Plant at Michigan State University
March 10, 11, 12, 2009. 8:00 AM-5:00 PM
Registration fee of $425 per person
Ways to Register:
Phone 517-355-8474x114 to register using your credit card. Or, fax your completed registration form, along with your credit card information, to 517-353-8963, attention Cheese Workshop Registration. Or, mail your completed registration form with payment to Cheese Workshop, c/o Linda Young, Michigan State University, 236 G.M. Trout FSHN Building, East Lansing, MI 48824-1224.

The registration deadline is February 26. For information contact workshop coordinators Dr. John A. Partridge 517-355-7713 x179 FAX: 517-353-1676 partridg@msu.edu or G. William Robb 616-994-4580 robbg@msu.edu
Growing up on a beef farm in Lawrence, Nicole Beeching knew she wanted to stay involved in animal agriculture, but wasn’t always clear on how she could do it. With industry trends moving toward larger farms her dream of running a small operation didn’t seem very forward-thinking, and outside of operating a farm or veterinary practice, the options appeared limited.

But after her experiences as an Animal Science student at Michigan State University, and especially the internship she completed with Cargill Nutrition last summer working directly with farmers and animal nutritionists, Beeching sees a lot more possibilities for her future.

“I thought the only way I’d be able to work with animals every day was to own a farm or be a vet,” she said, “but then I came here and did a few Dairy Challenges and learned that there are a lot of other things out there and the internship solidified that for me.”

Real-world Application

Beeching’s internship with Cargill lasted from May through August. She spent approximately half her internship working regularly with four consultants, visiting four or five farms per day, talking with producers, and making recommendations about nutrition and cow comfort issues. The other half she spent working on a time and feeding efficiency project. Both of these projects gave her a unique opportunity to see the work she had done in MSU classrooms brought to life.

“I guess I didn’t understand how much went into being a feed consultant. I guess I thought it would be boring to go out and look at feed and take samples but there’s so much more to it, it was never boring” she said. “We always talk about what to put in a ration to change milk production or milk fat percentage but to be able to go onto a farm and make that change and go back and see it the next week solidified that, ‘okay, this really works.’”

The Human Aspect

Next to challenging her to pay attention to more facets of farm management than she’d earlier considered, her internship with Cargill allowed her to fine-tune her people skills. Meeting with four dairy producers in a single day requires developing four different relationships, and understanding four sets of needs. “They really appreciate it if you take the time to talk to them. They appreciate that you’ve got to talk with them and establish a relationship and I really enjoyed that.”

Like Beeching, fellow Animal Science student Laura Zeldenrust knew she wanted to work in animal agriculture, but when she became involved in the Dairy Challenge Team at Michigan State University, she did not know the connections she made there would shape her professional goals.

Through the Dairy Challenge, Zeldenrust met Bill Earley, Dairy Business Manager for ADM Alliance Nutrition. Students are encouraged to explore internship opportunities and build relationships with companies on their own, and Zeldenrust’s conversations with Earley eventually led to her experience as a summer intern with ADM Alliance Nutrition, learning more about a side of dairying she hadn’t given much thought to previously.

She spent the early weeks of last summer at ADM Headquarters in Illinois, then filled out the rest of her summer in Michigan, working with other nutritionists and making farm visits that she said were as much about people skills as Animal Science.

“The main thing I learned came through meeting and getting to communicate with different types of people and the business aspect of dairying,” she said. “I think maybe I learned more about business than nutrition.”

Discovering the Dairy Industry

Before she was born her parents ran a dairy and Zeldenrust has always had an interest in dairying. A senior at Michigan State University, she saw a summer internship as one way to broaden her experiences and get a closer look at the relationship between dairy producers and allied-industry professionals, possibly with an eye on future work in the dairy industry.

A large part of Zeldenrust’s work with ADM Alliance Nutrition involved facilitating a survey of dairy producers the company could use to guide their efforts. She said meeting with producers about the survey was not initially easy, but that as she gained experience and learned how to interact effectively with different clients, it became rewarding.
Gaining real-world experience

“My job was just to stop out there and I had a producer survey I would do to get an idea of the producers in the area,” she said. “I got onto the farms and talked to people and saw what they were doing in their operations. We were looking at things like the size of farms and also information on any industry trends. Last summer high feed prices were on everyone’s mind.”

Building Young Leaders
Earley said that in addition to the experience surveying, ADM Alliance Nutrition worked to give Zeldenrust a broad experience that spoke to her specific interests. She did ride-alongs with nutritionists, and had the opportunity to network with several large animal veterinary facilities.

“What we try to do on internships is to match the student’s interests and things they’ve done academically with our company objectives. So, it’s not a one-size-fits-all situation, it’s essentially an internship developed between ourselves and the students,” he said. “We want to balance it out and mix a bit of her interests with things we want to get accomplished.”

Earley said internships, at least for ADM Alliance Nutrition, focus on creating future nutrition professionals. Even as the internships conclude, there is a recap and review aimed at helping both the intern and company make the most of the experience. “We want to make sure we’re on target with our internships and make sure there are opportunities for the student to learn and grow across the project and learn what roles the nutritionist plays,” Earley said.

All of which is part of what Earley called, “shaping the young leaders of tomorrow.”

“In any business whether agriculture or any other business, success is predicated upon good people. So, we want to do what we can to expose up and coming students to the opportunities available in animal agriculture. We help them gain appreciation for the breadth nutrition plays on the farm and utilize all the skills they learn at Michigan State whether they be reproduction, animal nutrition or animal health.”

For Beeching, being part of that process involved rethinking not only what she’d learned in school, but also what opportunities are available to her after she graduates.

“In my internship, I saw the practical application of what I learned in school and learned that being a nutrition consultant is about a lot more than feed,” she said. “You have to look at everything on the farm.”

Laura Zeldenrust

Internship Q & A
What is the MSU Internship Program?
The MSU Internship Program is a way for motivated students to gain industry experience in beef, dairy, equine, poultry, swine and other animal agriculture related areas.

Do internships include wages and living accommodations?
Many internships are paid and also include a place to live, but others expect that the experience will be adequate motivation for interns. It is important to ask questions of company representatives when negotiating an internship.

Who can experience an internship?
All MSU juniors and seniors majoring in Animal Science are eligible to participate in the Internship Program.

How do I obtain an internship?
The first step in obtaining an internship in Animal Science is to submit a professional resume to the internship coordinator. A meeting with the coordinator to discuss options follows. Throughout the process, students should be looking actively for internship opportunities that interest them. The more you work on generating internship possibilities the higher the chance you will have of obtaining an internship. Students interested in a dairy internship should contact Dr. Miriam Weber-Nielsen (msw@msu.edu).
Milk Market and Policy Update: The New MILC Program

Christopher Wolf
Dept. of Agricultural, Food, and Resource Economics

The cheese market collapsed in December. On December 1, spot block cheese prices at the Chicago Mercantile Exchange closed at $1.79/lb. On December 31, that price was $1.13/lb (and continuing down below support at $1.08/lb as of early January, 2009). Domestically, the poor economy and uncertainty is leading to less meals away from home and less cheese consumed. Internationally, the market for US dairy products is declining and exports are contracting. The result is a very dismal milk price outlook for 2009.

Extension of MILC Program

With the poor milk price outlook, perhaps the most important change in the Dairy Title of the 2008 Farm Bill was the extension of the Milk Income Loss Contract (MILC) program and inclusion of a feed cost adjuster. Previously—thinking back to the 2002 Farm Bill—we forecasted the MILC payments using the higher of the Class III or Class IV prices. We can use this again to forecast the Class I mover but now we must also think about the effect of feed prices. The new procedure for calculating the MILC payment is as follows:

1. The base target price is $16.94/cwt Boston Class I price. The milk price used is the Class I mover which is announced by the 23rd of the preceding month plus a fixed differential of $3.25/cwt.
2. This target price is adjusted by a feed index if the USDA dairy ration cost exceeds $7.35/cwt of feed. The USDA ration is composed of 51 pounds of corn, 8 pounds of soybeans and 41 pounds of alfalfa hay where all are prices received by farmers.
3. The percentage that the ration cost is greater than $7.35/cwt is multiplied by 45% and used to adjust the target price.
4. That target price is used compared to the actual Boston Class I price and producers are paid 45% of the difference for up to 2.985 million pounds of production.

A weekly updated forecast of the MILC payments is available at the National Milk Producers Federation website (www.nmpf.org) and I suggest you check it periodically. However, it is useful to go through a forecasting exercise using current prices.

A MILC Example

Corn and soybean prices were forecasted using the Chicago Board of Trade futures closing price. For months that do not have a contract offered, the price was interpolated. To arrive at an estimate of price received by farmers, which is the value used, an average basis was subtracted. Forecasting alfalfa hay prices is more difficult. Over the past 5 years, the US

<table>
<thead>
<tr>
<th>Month</th>
<th>Corn $/bu</th>
<th>Soybeans $/bu</th>
<th>Alfalfa Hay $/ton</th>
<th>Feed $/cwt</th>
<th>Feed-$7.35 $/cwt</th>
<th>Difference over Target %</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>3.74</td>
<td>9.99</td>
<td>150</td>
<td>7.38</td>
<td>0.03</td>
<td>0.38</td>
</tr>
<tr>
<td>February</td>
<td>3.88</td>
<td>9.97</td>
<td>150</td>
<td>7.61</td>
<td>0.26</td>
<td>3.53</td>
</tr>
<tr>
<td>March</td>
<td>3.91</td>
<td>9.94</td>
<td>150</td>
<td>7.64</td>
<td>0.29</td>
<td>3.88</td>
</tr>
<tr>
<td>April</td>
<td>3.96</td>
<td>9.99</td>
<td>150</td>
<td>7.69</td>
<td>0.34</td>
<td>4.62</td>
</tr>
<tr>
<td>May</td>
<td>4.02</td>
<td>10.03</td>
<td>150</td>
<td>7.85</td>
<td>0.50</td>
<td>6.77</td>
</tr>
<tr>
<td>June</td>
<td>4.07</td>
<td>10.08</td>
<td>150</td>
<td>7.90</td>
<td>0.55</td>
<td>7.53</td>
</tr>
<tr>
<td>July</td>
<td>4.12</td>
<td>10.13</td>
<td>150</td>
<td>7.96</td>
<td>0.61</td>
<td>8.29</td>
</tr>
<tr>
<td>August</td>
<td>4.18</td>
<td>10.09</td>
<td>150</td>
<td>8.00</td>
<td>0.65</td>
<td>8.89</td>
</tr>
<tr>
<td>September</td>
<td>4.23</td>
<td>9.85</td>
<td>150</td>
<td>8.02</td>
<td>0.67</td>
<td>9.12</td>
</tr>
<tr>
<td>October</td>
<td>4.26</td>
<td>10.09</td>
<td>150</td>
<td>7.86</td>
<td>0.51</td>
<td>7.00</td>
</tr>
<tr>
<td>November</td>
<td>4.28</td>
<td>10.06</td>
<td>150</td>
<td>7.88</td>
<td>0.53</td>
<td>7.23</td>
</tr>
<tr>
<td>December</td>
<td>4.37</td>
<td>10.10</td>
<td>150</td>
<td>7.97</td>
<td>0.62</td>
<td>8.38</td>
</tr>
</tbody>
</table>

1All prices forecast as of January 16, 2009.
average alfalfa hay price received was $120/ton. But the price has been increasing over that period with the 2007 average at $130/ton and 2008 average at $162/ton. If you were purchasing you would still need to add hauling and this average does not account for variation in hay quality. We use $150/ton in this MILC forecast. The weighted cost of a hundred pounds of feed forecast is displayed in Table 1. The feed cost is projected to exceed the target of $7.35/cwt of feed for every month of 2009 at the current time. The percentage it exceeds this target is multiplied by 45% to adjust the target price below. For example, the June cost is 7.53% over $7.35/cwt so that the June target price will be increased by 3.39% (=7.53% x 45%).

Using the Class III and Class IV futures prices as of January 16 we can predict the Class I mover which is the higher of those prices at about the middle of the preceding month. The Class III and IV prices are announced at the beginning of the following months. Therefore, we will predict the Class I mover as the higher of the average of Class III and IV from the two months preceding the month in question (e.g., January and February for March). The January Boston Class I price was already announced at $18.99/cwt in December. The target price for MILC payments is still $16.94/cwt for the Boston Class I price. The outlook at this time is for very poor prices which would trigger payments for the remainder of 2009. With any luck the prices will have recovered somewhat by the time this article is read but the milk price is currently forecasted below support in early 2009. This can occur because the cheese manufacturers are not usually set up to sell to the government at short notice. They must package cheese for long-term storage and the Commodity Credit Corporation (CCC) must get their buyers ready to purchase cheese. Thus, price can be below support for short periods.

Table 2 completes the MILC payment forecasting exercise. First the Boston Class I target of $16.94/cwt is adjusted for the feed cost. Then the difference between this adjusted target and the projected Boston Class I price is multiplied by 45% to arrive at a projected MILC payment. At the current time, the months of March through June look like they may be the highest pay rates. Of course, this projection will change with not only the milk prices but the corn, soybean and hay prices as well.

### Signup Rules

Signup is currently available through the Farm Service Agency (FSA). Producers with less than 2.985 million pounds may just as well pick October 2008 as a start month and will receive that start month—which is the beginning of the fiscal year—in future years with no need for additional signup or changes. They will not, however, receive a payment prior to February 2009 because payments were zero from October 2008-January 2009. If producers pick a start month for 2009 (say February) but do not pick one for future years, that start month will be the default unless they go back to FSA and change it.

For FY 2009 (October 2008-September 2009) producers can choose as their MILC payment start date the same month during which they submit their contract. For example, a producer who submits his contract any time in February can choose February as his start date. Similarly, a producer who submits his contract in May can choose May as his start date. In the following years, producers will need to sign up by the 14th of the preceding month. MILC eligibility is subject to a $500,000 limit on non-farm Adjusted Gross Income (AGI), but there is no eligibility limit on total or farm-based AGI.

<table>
<thead>
<tr>
<th>Month</th>
<th>Base Target</th>
<th>Feed Cost Adjusted Target</th>
<th>Projected Class I mover</th>
<th>Projected MILC Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>16.94</td>
<td>16.97</td>
<td>18.99²</td>
<td>0</td>
</tr>
<tr>
<td>February</td>
<td>16.94</td>
<td>17.21</td>
<td>15.04</td>
<td>0.98</td>
</tr>
<tr>
<td>March</td>
<td>16.94</td>
<td>17.24</td>
<td>13.50</td>
<td>1.68</td>
</tr>
<tr>
<td>April</td>
<td>16.94</td>
<td>17.29</td>
<td>13.63</td>
<td>1.65</td>
</tr>
<tr>
<td>May</td>
<td>16.94</td>
<td>17.46</td>
<td>13.85</td>
<td>1.62</td>
</tr>
<tr>
<td>June</td>
<td>16.94</td>
<td>17.51</td>
<td>14.23</td>
<td>1.48</td>
</tr>
<tr>
<td>July</td>
<td>16.94</td>
<td>17.57</td>
<td>14.60</td>
<td>1.34</td>
</tr>
<tr>
<td>August</td>
<td>16.94</td>
<td>17.62</td>
<td>15.00</td>
<td>1.18</td>
</tr>
<tr>
<td>September</td>
<td>16.94</td>
<td>17.64</td>
<td>15.67</td>
<td>0.89</td>
</tr>
<tr>
<td>October</td>
<td>16.94</td>
<td>17.47</td>
<td>16.26</td>
<td>0.55</td>
</tr>
<tr>
<td>November</td>
<td>16.94</td>
<td>17.49</td>
<td>16.47</td>
<td>0.46</td>
</tr>
<tr>
<td>December</td>
<td>16.94</td>
<td>17.58</td>
<td>16.52</td>
<td>0.48</td>
</tr>
</tbody>
</table>

¹ All prices forecast as of January 7, 2009. All values in table are expressed as $/cwt.
² The January Boston Class I price was known at the time this was written.
Carbon Market Opportunities for Agriculture

Carbon markets offer the potential to reduce greenhouse gases by allowing dairy producers and other industries to sell carbon credits generated by employing greenhouse gas-reducing management practices. This article explains what carbon markets are, how they are gaining prominence, and the first steps dairy producers can take to develop an on-farm project to produce carbon credits.

Dave Beede  
Dept. of Animal Science

Wendy Powers  
Dept. of Animal Science
Dept. of Biosystems and Agricultural Engineering

Carbon credits generated by agriculture are a relatively new commodity. They are generated on-farm by employing a management practice or project that reduces emissions of greenhouse gases (GHG; such as methane, nitrous oxide, or carbon dioxide). The amount of carbon credits generated on farm are measured and verified, typically by an independent, third-party verifier. They are sold in markets to other businesses (polluters) that purchase “carbon offsets” as an environmental attribute.

A carbon credit is a metric ton (2204 lbs) of carbon dioxide equivalent (CO\textsubscript{2}e). It is the currency for trading of GHG emissions that are reduced, destroyed (e.g., burning), removed from the air, or never produced. Carbon markets have been established because GHG polluters either voluntarily (as in most of the U.S. currently) or through mandatory legislation (e.g., cap-and-trade laws) purchase carbon offsets to enable them to emit in excess of their defined cap limit. Cap-and-trade legislation and carbon markets have been in Europe and other countries for several years. The U.S. currently does not have a national cap-and-trade system for carbon. However, California recently instituted its own cap-and-trade system.

Primary goals of carbon markets are to reduce GHG emissions and provide an organized, competitive, market-driven mechanism to reduce these emissions, and to reduce, over time, the absolute quantity in GHG emissions. Demand for carbon offsets occurs when a cap-and-trade system or perhaps a carbon tax is implemented. Also, while carbon trading is going on among sellers and buyers, polluters are required by legislation to reduce absolute emissions incrementally over time.

Currently, carbon credits from agriculture can be generated by carbon sequestration in trees (forests), soil/tillage practices, or from capture of methane in anaerobic digesters. In the case of methane it can be flared-off, producing carbon dioxide (which is 21-times less potent as a GHG as methane); used to generate electricity; or, cleaned and compressed to natural gas to produce power or heat. Other potential practices to reduce carbon emissions and produce carbon credits are being researched (e.g., reduction in digestive tract methane production by ruminants).

The market price for carbon offsets varies depending upon demand. In June 2008 carbon offsets were worth about $7.50 per metric ton of CO\textsubscript{2}e on the Chicago Climate Exchange. In December 2008, the market price was just over $1.00 per metric ton. When a federal cap-and-trade system is implemented and demand for offsets increases, U.S. prices are projected to increase to $10 to $12 per metric ton by 2012, $20 by 2020, and $45 by 2030 as markets develop.

An agricultural business desiring to develop an on-farm practice or project to generate and sell carbon credits can work with a ‘carbon broker” or aggregator who understands carbon markets. They also facilitate on-farm measurement of credit generation, third-party verification, and bundling of credits from several farms to help market carbon credits.

Carbon markets provide a financial opportunity to adopt conservation and mitigation technologies and practices to reduce GHG. They also offer some agricultural businesses the potential to generate revenue, and to help compensate for additional on-farm costs associated with voluntary and/or future mandatory air quality improvements and energy management.

Dairy Farm Survey: Greenhouse Gas Lifecycle Assessment

As concerns about the effects of animal agriculture on the global climate rise, sustainability has become a mainstream value to current shareholders and a key factor in product branding. It is crucial that the dairy industry be proactive about determining exactly what our environmental impact is. In order to provide an accurate assessment of the role animal agriculture plays in the global climate and improve our ability to market products to “green” consumers, Dairy Management, Inc. is working with the Michigan Milk Producers Association and other co-ops to survey dairy producers and pinpoint the carbon footprint of dairying. The survey is comprehensive, likely taking 4 hours to complete, but it will be a valuable tool for strengthening the dairy industry. If you have received a survey, you are encouraged to complete it. You were randomly selected and your answers are anonymous. Producers who participate are eligible for a $500 cash prize from the co-op. Producers are never identified and farm data are coded by number only, not farm name. The survey closes February 19.
Calendar of Events
January - April

Ag Market Update
Jan. 27, 10:00-12:00
Sanilac County Extension Office
37 Austin Street, Sandusky
Contact: 810-648-2515

Agriculture’s Conference on the Environment
Jan. 28
Lansing Convention Center
333 E. Michigan Ave., Lansing
Contact: 517-241-2232

Manure Sense
Feb. 3, 10:00-3:30
Clinton County RESA
1013 US-27, St. Johns
Contact: 517-353-3174

Great Lakes Regional Dairy Conference
Feb. 5-7, 2009
Crowne Plaza Hotel
5700 28th St SE, Grand Rapids
Contact: <http://www.glrdc.msu.edu/>

Manure Sense
February 17, 10:00-3:30
Huron County Farm Bureau Building
711 North Van Dyke, Bad Axe
Contact: 517-353-3174

PC DART Producer Workshop
Feb. 17, 10:00-3:00
The Kettunen Center
14901 4-H Drive, Tustin
Contact: 1-800-631-3510

PC DART Producer Workshop
Feb. 18, 10:00-3:00
Franklin Inn
1060 E. Huron Avenue, Bad Axe
Contact: 1-800-631-3510

PC DART Producer Workshop
Feb. 19, 10:00-3:00
Comfort Inn
1000 Orleans Road, Coldwater
Contact: 1-800-631-3510

Ag Market Update
Feb. 19, 10:00-12:00
Clinton County Extension Office
100 E. State Street, St. Johns
Contact: 989-224-5240

PC DART Producer Workshop
Feb. 20, 10:00-3:00
Clinton County RESA Facility
1013 South US 27, St. Johns
Contact: 1-800-631-3510

Ag Market Update
Feb. 24, 10:00-12:00
Sanilac County Extension Office
37 Austin Street, Sandusky
Contact: 810-648-2515

Manure Sense
February 25, 10:00-3:30
Howard Miller Public Library
14 S. Church St., Zeeland
Contact: 517-353-3174

Ag Market Update
Mar. 19, 10:00-12:00
Clinton County Extension Office
100 E. State Street, St. Johns
Contact: 989-224-5240

Ag Market Update
Mar. 24, 10:00-12:00
Sanilac County Extension Office
37 Austin Street, Sandusky
Contact: 810-648-2515

Michigan Agri-energy Conference
Mar. 30,31
Kalamazoo Radisson
100 West Michigan Avenue, Kalamazoo
Contact: 517-353-3175 x229

Tri-State Dairy Nutrition Conference
Apr. 21,22
Grand Wayne Center
120 W Jefferson Blvd, Fort Wayne, IN
Contact: <http://tristatedairy.osu.edu>
Michigan Dairy Review

Volume 14
Number 1


Editor & Publisher .................................................. Dr. David K. Beede
Final Copy Editor ..................................................... Dr. Kathy Lee
Managing Editor ..................................................... Jacob McCarthy
Circulation ................................................................. 5,800

Permission to reprint or translate and reprint from Michigan Dairy Review is granted provided that the intended meaning is not changed and that explicit credit is given to the authors and publication source. If the original article is adapted, paraphrased, or changed in any other way please send facsimile (517-432-0147) of the new version to the Publisher for verification of meaning and approval. Please send a copy of the reprinted article to the Publisher. Product and service names are used only for the sake of clarity and in no way imply endorsement over similar products or services which may be just as effective. MSU is an affirmative-action, equal-opportunity employer. Michigan State University Extension employment opportunities are open to eligible/qualified persons without regard to race, color, national origin, gender, gender identity, religion, age, height, weight, disability, political beliefs, sexual orientation, marital status, family status or veteran status. Persons with disabilities have the right to request and receive reasonable accommodations. MSU is committed to achieving excellence through cultural diversity. The university actively encourages applications and nominations of women, persons of color, veterans and persons with disabilities. Printing and distribution of Michigan Dairy Review is supported by a competitive grant from funds of the Michigan Animal Agriculture Initiative administered by MSU’s Animal Industry Coalition.

Non-Profit Org
U.S. POSTAGE
PAID
E. Lansing, MI
Permit No. 21